



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
--------------------	-------------	-----------------------	---------------------

09/132,157 08/11/98 FORBES

L 303,229US2

EXAMINER

MM61/1215

SCHWEGMAN LUNDBERG WOESSNER & KLUTH
P O BOX 2938
MINNEAPOLIS MN 55402

PRENTY, M

ART UNIT

PAPER NUMBER

2822

DATE MAILED:

12/15/98

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

☒ Responsive to communication(s) filed on 10/7/98

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 11-14 and 24-37 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 11-14 and 24-37 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of Reference Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

This Office Action is in response to the "Second Preliminary Amendment" filed October 7, 1998 and supersedes the Office Action mailed October 27, 1998 (although that previous Office Action's attachments are incorporated herein).

Claims 11-14, 24, 26, 28-31 and 33-35 are rejected under 35 U.S.C. §102(b) as anticipated by Nayak et al. (IEEE Electron Device Letters, Vol. 12, No. 4, April 1991, pages 154-156). See the entire reference.

Claims 25, 32 and 37 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Nayak et al. (IEEE Electron Device Letters, Vol. 12, No. 4, April 1991, pages 154-156). See the entire reference. Note that a device claim's process limitations are not determinative of patentability. See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Claims 30 and 31 are rejected under 35 U.S.C. §102(b) as anticipated by Sato et al. (United States Patent 5,285,088). See the entire patent.

Claims 32 and 37 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Sato et al. (United States Patent 5,285,088). See the entire patent. Note that a device claim's process limitations are not determinative of patentability. See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Claims 11, 14, 24, 28 and 30 are rejected under 35 U.S.C. §102(b) as anticipated by Selvakumar et al. (United States Patent 5,426,069). See Selvakumar et al's Figs. 1-7 embodiment in particular.

Claims 25, 32 and 37 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Selvakumar et al. (United States Patent 5,426,069). See Selvakumar et al's Figs. 1-7 embodiment in particular. Note that a device claim's process limitations are not determinative of patentability.

See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Claims 30, 31, 33 and 34 are rejected under 35 U.S.C. §102(e) as anticipated by Crabbe' et al. (United States Patent 5,821,577). See the entire patent.

Claims 32 and 37 are rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Crabbe' et al. (United States Patent 5,821,577). See the entire patent. Note that a device claim's process limitations are not determinative of patentability. See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Claims 12-13, 26, 27, 29, 31 and 33-35 are rejected under 35 U.S.C. §103 as being unpatentable over Selvakumar et al. (United States Patent 5,426,069) together with Crabbe' et al. (United States Patent 5,821,577).

With respect to dependent claims 12, 29 and 33-35, the difference between their transistor and Selvakumar et al's transistor is that they are p-type and n-type, respectively. Crabbe' et al. illustrates a p-type SiGe channel transistor. It would have been obvious to one skilled in this art to extend Selvakumar et al's SiGe disclosure to a p-type transistor as suggested by Crabbe' et al.. Claims 12, 29 and 33-35 are thus rejected under 35 U.S.C. §103 as being unpatentable over Selvakumar et al. together with Crabbe' et al..

With respect to dependent claims 13, 26, 27 and 31, the difference between their transistor and Selvakumar et al's transistor is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26 and 31) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been obvious to one skilled in this art to

make Selvakumar et al's SiGe channel 100 to 500 angstroms thick as suggested by Crabbe' et al.. Claims 13, 26, 27 and 31 are thus rejected under 35 U.S.C. §103 as being unpatentable over Selvakumar et al. together with Crabbe' et al..

Claims 11, 12, 14, 24, 25, 28-30, 32-34, 36 and 37 are rejected under 35 U.S.C. §103 as being unpatentable over Maeda et al. (United States Patent 5,512,772) together with Selvakumar et al. (United States Patent 5,426,069). Specifically, the difference between Maeda et al. (see Figure 1's transistor M2) and the set of rejected claims is their channels comprise Si and SiGe, respectively. Selvakumar et al. teaches SiGe channels (see Selvakumar et al's Figures 1-7 embodiment in particular). It would have been obvious to one skilled in this art to provide Maeda et al's transistor M2 with a SiGe channel to enhance its performance as taught by Selvakumar et al.. Claims 11, 12, 14, 24, 25, 28-30, 32-34, 36 and 37 are thus rejected under 35 U.S.C. §103 as being unpatentable over Maeda et al. together with Selvakumar et al..

Claims 13, 26, 27 and 31 are rejected under 35 U.S.C. §103 as being unpatentable over Maeda et al. (United States Patent 5,512,772) together with Selvakumar et al. (United States Patent 5,426,069) and Crabbe' et al. (United States Patent 5,821,577). Specifically, the difference between the obvious Maeda et al. / Selvakumar et al. device (discussed above) and the set of rejected claims is that the latter's SiGe channel thickness is unknown while the former's SiGe channel thickness is "approximately 100 to 1,000 angstroms" (claims 13, 26 and 31) or "approximately 300 angstroms" (claim 27). Crabbe' et al. discloses forming SiGe channels 100 to 500 angstroms thick (see column 6, lines 17-22). It would have been obvious to one skilled in this art to make the obvious Maeda et al. / Selvakumar et al. device's SiGe channel 100 to 500 angstroms thick as suggested by Crabbe' et al.. Claims 13, 26, 27

and 31 are thus rejected under 35 U.S.C. §103 as being unpatentable over Maeda et al. together with Selvakumar et al. and Crabbe' et al..

Registered practitioners can telephone examiner Prenty at (703) 308-4939. All other parties should telephone Toby Brown at (703) 308-4083. The fax number is (703) 308-7722.

Mark Prenty
Mark V. Prenty
Primary Examiner